

EASTERN SHORE ONLINE BIOLOGY CONSORTIUM YEAR 2 EVALUATION REPORT

November 2008

Prepared for:



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Eastern Shore Online Biology Consortium Year 2 Evaluation Report

Submitted to:



Submitted by:



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Introduction

The Eastern Shore Online Biology Consortium (ESOBC) is a partnership of six Eastern Shore school systems (Caroline, Queen Anne's, Somerset, Talbot, Wicomico and Worcester), the University of Maryland's University College, Salisbury University, and the Maryland State Department of Education (MSDE). Worcester County serves as the lead agency for the project, while representatives from each of the partners serve on a project Advisory Committee. As described in its application for MSDE funding, the grant seeks to address the needs of the large percentage of students who are struggling to pass the biology HSA.

During the 2007-2008 school year, the ESOBC provided professional development to high school biology teachers, special education, and ELL teachers. All of the professional development that the teachers received was aimed at addressing a primary objective of the grant: to improve instruction for students who need to pass the Maryland High School Assessment in biology.

Teachers in the course received professional development to help them use an MSDE-developed online biology course in their classrooms with students. As the ESOBC application for funds states, "Teachers in these Eastern Shore counties and across Maryland will need to be thoroughly familiar with the course in order to take advantage of its many benefits in helping to prepare their students to pass the mandatory High School Assessment in biology." In addition, many of the teachers participated in a pilot of the MSDE online biology course by using various sections of the course with their students. They also received professional development on how to integrate other technological resources into their classrooms.

Page 3 shows a logic model of the ESOBC project—that is, a graphic representation of grant activities and their intended educational impacts. In the left hand column it shows the important inputs for the grant, such as the MSDE's online biology course modules and technology provided to the teachers, such as iPods and interactive whiteboards.

The second column presents the short-term outcomes of the grant. For the 2007-2008 school year, those outcomes include an online course by Salisbury University on how to use the MSDE online course biology modules and trainings on how to effectively use iPods and interactive whiteboards in the classroom.

The last two columns show the intended longer-term impact of these activities. The professional development and teacher support provided helped teachers to use the course in a pilot with their students. The pilot of the MSDE online biology modules gave teachers an opportunity to provide important feedback on the modules. This will be used to inform future professional development in similar projects, as well as possible revisions to the course itself. All of the project activities contribute to increased teacher knowledge and skills. The overall grant goal (shown in the final column) is increased student achievement on the biology High School Assessment (HSA).

Macro International began work as the external evaluator of the Eastern Shore Online Biology Consortium in May 2007. This report evaluates the grant's progress through the end of the grant in September 2008, and addresses both the extent to which grant activities have taken place as planned and the effectiveness of these activities. The first section is a description of the grant activities, as well as the teachers involved. The second section of the report looks at the long-term outcomes: the MSDE online biology course pilot, feedback from teachers in the pilot, changes in teachers' biology content knowledge and student achievement on the HSA biology exam.

Logic Model for Eastern Shore Online Biology Consortium Grant

INPUTS

- Federal Math-Science Partnership (MSP) program
- Need for improved achievement on biology HSAs in partner LEAs
- Expertise of higher education partners in online teacher professional development
- MSDE's online biology modules
- Technology provided to teachers

OUTCOMES

Short-Term

Long-Term

UMUC Foundations of Teacher and Learning course to prepare teachers to use online platforms in the classroom

Face-to-face training in the use of the biology modules provided by MSDE

Salisbury University-led professional development on use of the biology modules

Training on how to effectively use iPods and interactive whiteboards in the classroom

Piloting of MSDE's biology modules in the classroom

Formative feedback on online instruction from teachers and students

Increased teacher knowledge and skills

Improved student biology achievement (Goal 1)

Part I: Evaluation of Grant Activities

The first two activities listed in the logic model on page 3—an online course facilitated by the University of Maryland’s University College and professional development on the biology course provided by MSDE—took place in the fall of 2007. These activities were discussed in Macro’s first annual evaluation report. The activities discussed in this report took place during the Spring 2008 school term as well as the early part of the summer of 2008.

A. Salisbury University Online Course

As part of this grant, Salisbury University offered a professional development course for the teachers participating in the project. The purpose of this course was to instruct teachers on how to most effectively use the MSDE online biology course with their students. Teachers had two opportunities to take the course: Spring and Summer 2008. The same survey as administered at the beginning and beginning and end of each course; in all, 26 teachers completed the pre-survey and 19 completed the post-survey. This survey is provided in Appendix A.

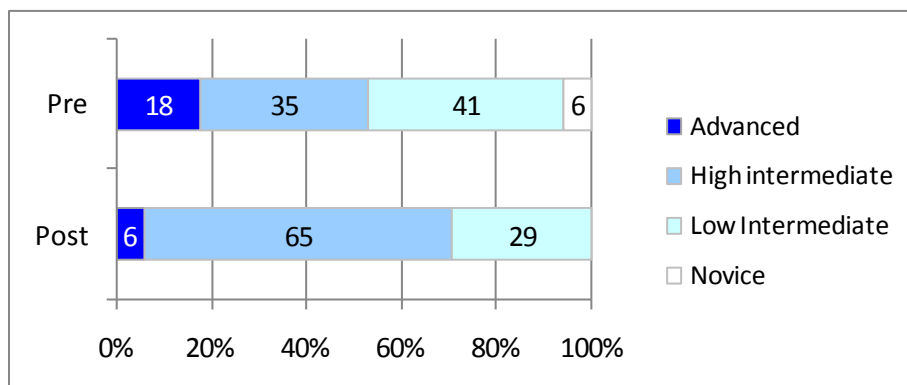
Frequency of Use of Technology

On the pre-survey, a majority of teachers indicated that they were using technology “very frequently” or “frequently” for both professional productivity (research, materials preparation, grades) and with students (96% and 85% respectively). On the post-survey there was very little change in these responses; 95 percent reported using technology for professional productivity “very frequently” or “frequently,” while 89 percent used technology with their students.

Proficiency with Technology

Participants were asked to rate their overall proficiency with technology both before and after the online course. As shown in Figure 1, the percentage of participants who rated themselves as at least “high intermediate” increased from 53 percent before the course to 71 percent after the course. Interestingly, the percentage who rated themselves as “advanced” actually decreased, from 18 percent to 6 percent. This may be due to the fact that as participants went through the online course, they gained a better appreciation for how much information about technology is available—that is, they became more aware of what they didn’t know.

Figure 1: Participants’ Proficiency with Technology (n=17)¹

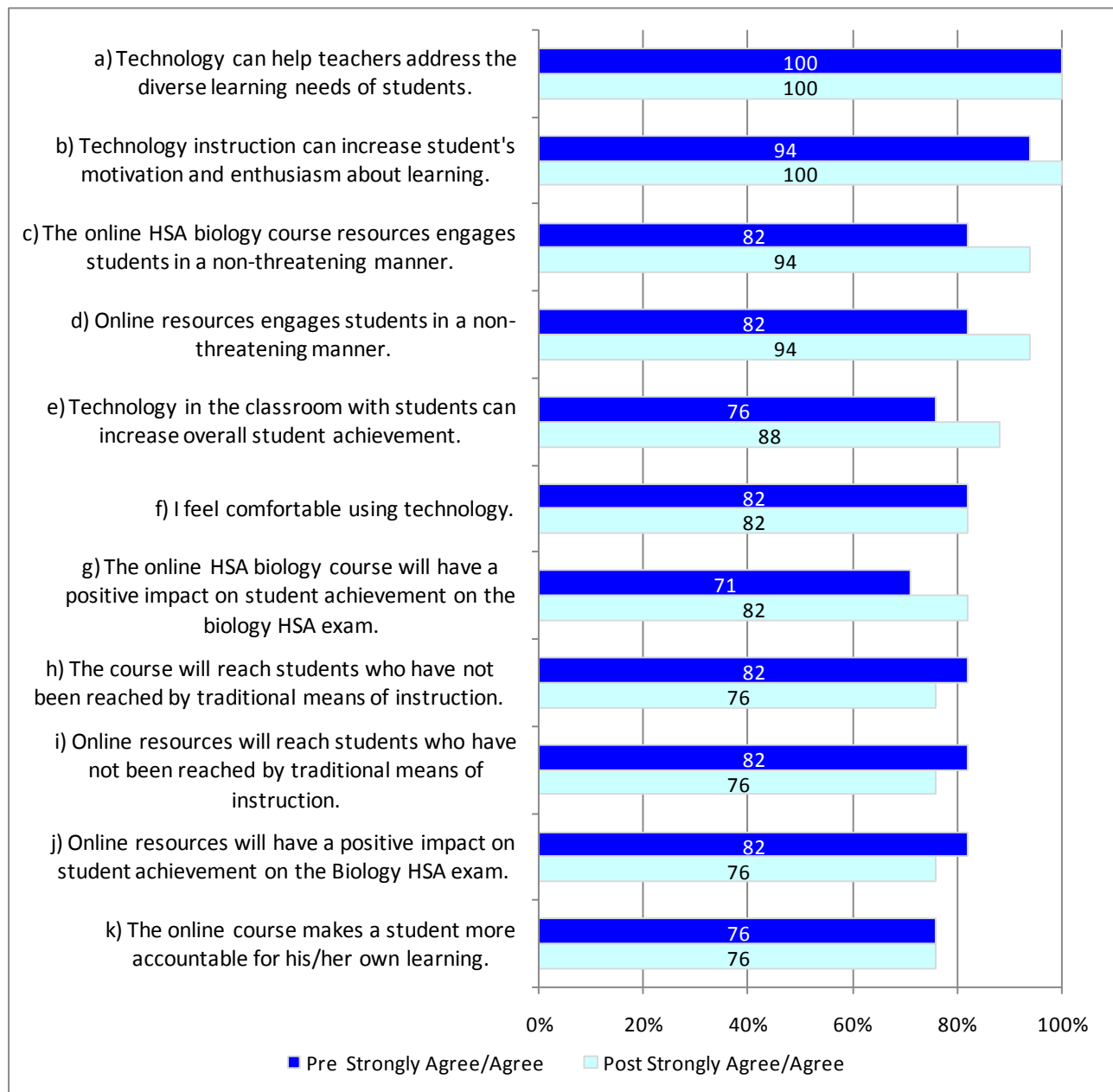


¹ Figure 1 only includes responses from those participants who completed both the pre- and post-surveys.

Impact of Technology, Online Resources, and the Online Biology HSA Course on Students

On both the pre- and the post-course survey, participants provided their feedback on how they felt about technology, the online biology HSA course, and its impact on their students. As shown in Figure 2, participants that completed both the pre- and post-course survey expressed positive views about using technology, online resources and the online biology course. The majority of them “strongly agreed” or “agreed” with the statements listed.

Figure 2: Participants’ Feedback about the Impact of Technology on Students (n=17)²



²Figure 2 only includes those participants who completed both the pre- and post-surveys.

Additional Comments

Teachers had an opportunity on both pre- and post-course surveys to describe the biggest challenges they encounter with teaching biology. For five teachers the biggest challenge was keeping students interested and motivated. Four teachers thought the biggest challenge was the large size of their classes; one added that this made it difficult for each student in the class to have access to a computer. Another problem that four teachers mentioned was the lack of student comprehension of some topics, as well as their low levels of reading ability. Other problems mentioned by at least one teacher were the lack of time available to teach the content and the difficulty of meeting the needs of students at different levels, including special education students.

B. Podcasting Workshops

Participants in the Eastern Shore Online Biology Consortium received several opportunities for professional development, as well as technological resources to help them address the goals and objectives of the grant. On May 5, 2008, some participants in the grant attended the first of two workshops on podcasting. During this session, each participant received their own iPod. A follow-up workshop on podcasting was held on May 8, 2008. This section of the report will take a look at the teachers that participated in these workshops and examine their feedback on several aspects of their experience. The survey administered at the first workshop is provided in Appendix B and the survey for the second workshop is in Appendix C.

Description of Participating Teachers

Macro collected 32 surveys from teachers who attended the first workshop and 30 surveys from teachers who attended the second workshop. Teachers at the workshops were from six Eastern Shore counties: Caroline, Queen Anne's, Somerset, Talbot, Wicomico and Worcester. The largest number of teachers was from Wicomico County, which had 10 teachers in attendance at the first session (Table 1).

While most participants taught high school (grades 9-12), a few teachers (4, or 13%) also taught lower grades. Eighty-four percent of participants taught biology; many of them (50%) also taught other science subjects such as anatomy, physiology, chemistry and earth science. Only one teacher also taught a non-science subject; (s)he taught math.

The teachers participating in the podcasting workshops had a mean of 13.1 years and a median of 9 years of teaching experience. Forty percent had more than 10 years of teaching experience, while only five teachers (16%) had five or fewer years of experience. However, teachers' experience teaching high school biology was significantly lower; only 19 percent reported 10 years or more of experience teaching this subject, while over half (55%) had five or fewer years of experience.

Table 1: Background Characteristics of Participating Teachers³

School District (n=32)	
Caroline County	5 (16%)
Queen Anne's County	4 (12%)
Somerset County	1 (3%)
Talbot County	5 (16%)
Wicomico County	10 (31%)
Worcester County	7 (22%)
Grades Taught (n=32)	
Grades 6-8	4 (13%)
Grade 9	16 (50%)
Grade 10	22 (69%)
Grade 11	19 (59%)
Grade 12	17 (53%)
Subjects Taught (n=32)	
Biology	27 (84%)
Other Science	16 (50%)
Non-Science Subjects ⁴	1 (3%)
Years of Teaching Experience (n=32)	
1 to 5 years	5 (16%)
6 to 10 years	14 (44%)
More than 10 years	13 (40%)
Years of Experience Teaching HS Biology (n=31)	
0 years	3 (10%)
1 to 5 years	14 (45%)
6 to 10 years	8 (26%)
More than 10 years	6 (19%)

When asked if they had used the MSDE online biology course with their students as of May 2008, more than half (53%) of the participants indicated that they had. Of these, seven teachers said they had used it only once, while ten teachers had used it more than once.

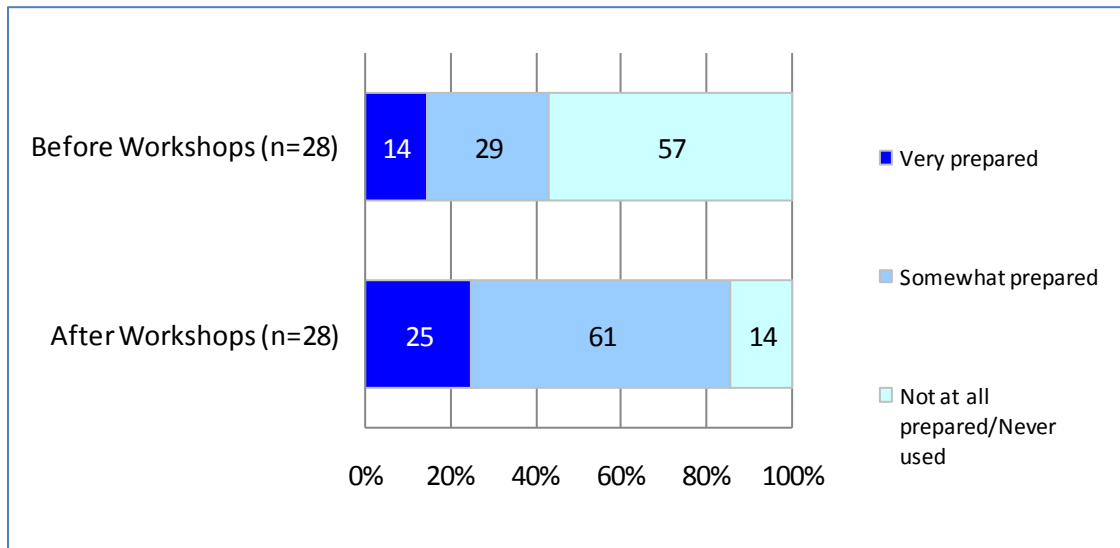
Experience Using the iPod

At the end of the second workshop, the participants were asked about their preparedness to use an iPod before and after the workshops (Figure 3). While over half of participants (57%) indicated that they were “not at all prepared” or had never used an iPod before the first session, only 14 percent still felt that they were “not at all prepared” after the second workshop. At the same time, the percentage who felt they were “very prepared” increased from 14 percent before the series of workshops to 25 percent after.

³ On some questions respondents could select more than one category, so percentages in those categories may total more than 100%.

⁴ In addition to teaching biology, one teacher at the workshop also taught math.

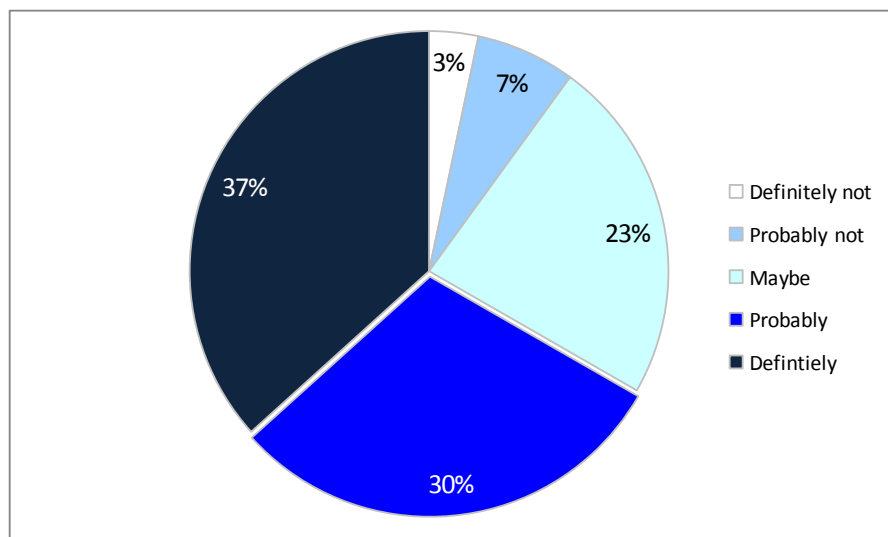
Figure 3: Preparedness to Use an iPod (n=28)⁵



Anticipated Future iPod Use

When asked how likely they were to create and use podcasts as part of teaching in the 2008-09 school year, participants gave mixed responses (Figure 4). Over one-third (37%) indicated that they would “definitely” create and use podcasts. Thirty percent said they would “probably” create and use podcasts, and 23 percent indicated that “maybe” they would do so. The remaining three participants (10%) indicated that they would “probably not” or “definitely not” create or use podcasts as part of their teaching next year.

Figure 4: Participants’ Likelihood of Using Podcasts Next Year as Part of Their Teaching (n=30)



⁵ Figure 3 only includes teachers that provided ratings of their preparedness both before and after the workshops.

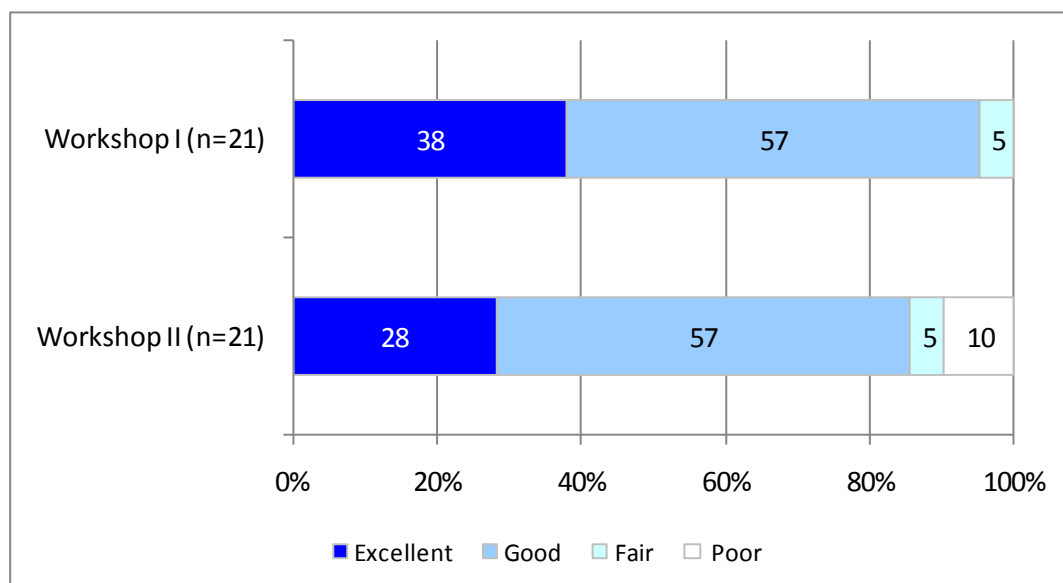
When asked to describe how they anticipated using their iPods, eleven teachers mentioned that they would use it in their classrooms for lectures, notes, reviews and extra credit or extension lessons. Eight teachers indicated that they would use their iPods for things such as differentiation or remediation, with students who are absent, and for working with special populations of students including special education students and English Language Learners. A few participants (3) anticipated using their iPods to gather information about current events. Other participants suggested some other ways that they might use their iPods, including sharing lessons, posting substitute lessons, downloading music and podcasts to use in the classroom, and interviews with community scientists. Three participants indicated that they were not sure how they would use their iPods.

Several teachers expressed some concerns about using the iPod in their classes. Eight questioned whether their students had access to various technological resources that would be needed to use podcasts, such as an iPod, Internet access and networking availability. Another concern shared by six respondents was that they needed more practice with the iPod and were not sure how to actually do a podcast. Three participants were concerned about finding the time it takes to create podcasts, and one wasn't sure how podcasts would fit into the curriculum.

Feedback on the Workshops

As shown in Figure 5, just over one-third of the teachers at the first podcasting workshop (38%) rated it as “excellent” overall. Over half (57%) rated it as “good” and one person thought it was “fair.” For the second session of the podcasting workshop, over one-quarter (29%) rated it as “excellent” and fifty-seven percent rated it as “good.” One person (5%) indicated they thought the workshop was “fair” and two participants (10%) rated it as “poor.”

Figure 5: Overall Feedback on Each Workshop (n=21)⁶



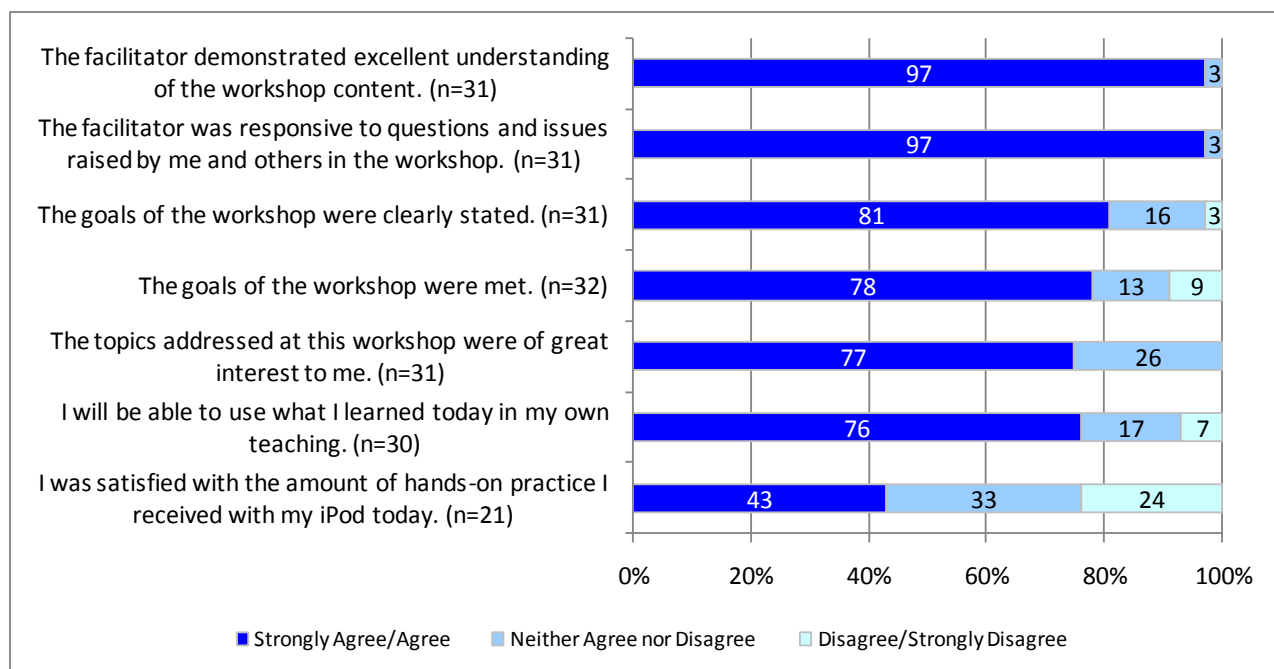
Most of the teachers (77%) who responded to the survey at the end of the first workshop indicated that they thought the pace of the workshop was “just right.” Four participants (13%) indicated that it was “too fast” and three (10%) thought that it was “too slow.” The respondents

⁶ Figure 5 only includes responses from participants that attended both workshops.

to the survey rated the length of the workshop in similar ways. Most (86%) rated the length of the workshop as “just right,” and only four rated (14%) it as “too long.” Questions on the pace and length of the workshop were only asked at the first workshop.

For both workshops, participants were asked to indicate the extent to which they agreed with a series of statements about their experience during the workshop. As shown in Figure 6, almost all of the respondents at the first workshop “strongly agreed” or “agreed” that the facilitator demonstrated excellent understanding of content and was responsive to questions and issues raised. Based on participants’ feedback the weakest aspect of the workshop was the amount of hands-on practice that they received. Only 43 percent “strongly agreed” or “agreed” with the statement, “I was satisfied with the amount of hands-on practice I received with my iPod today.” One-third “neither agreed nor disagreed” and the remainder (24%) “disagreed” or “strongly disagreed” with that statement.

Figure 6: Feedback on Various Aspects of Workshop I



For the second iPod workshop participants were asked to provide their feedback on four aspects of the event. At least two-thirds of the respondents at the second workshop “strongly agreed” or “agreed” with the following statements:

- This workshop was taught at an appropriate level. (83%)
- The topics addressed at this workshop were of great interest to me. (80%)
- I will be able to use what I learned today in my own teaching. (73%)
- I was satisfied with the amount of hands-on practice I received with my iPod today. (67%)

Participants' Comments and Suggestions for Improvement

When asked what aspects of the first workshop they liked most, the most common response (10 participants) was learning how to use podcasting and its real-life applications, in particular its application in the classroom. Eight respondents also mentioned that they liked the presenter and they thought that he was entertaining and knowledgeable about the topic. Two teachers mentioned that they liked most about this workshop was learning new technology, and one person admitted that what (s)he liked best was getting the iPod.

For the second iPod workshop many respondents (12) liked the hands-on exploration and practice that they received. Five participants mentioned that they liked learning how to use Audacity and learning how to edit their podcasts.

Participants at both workshops were given an opportunity to provide their suggestions for improvement. For both sessions of the podcasting workshops, one of the most common comments was that a lot of the information shared and the terminology used was “over their heads.” One person, for example, felt that the workshop was “a little too advanced” and that they needed to learn how to do “the basics” first.

Several of the participants thought that that both workshops went a bit too fast. Since a lot of information was covered in a short time, they wanted to have more time to use their iPods and for the workshop to go at a slower pace. Some other important suggestions for improvement included:

- Show examples of podcasts to give teachers an example of what education podcasts sound like;
- Clarify the terminology;
- Give the participants a copy of the PowerPoint presentation; and
- Have fewer participants in the room.

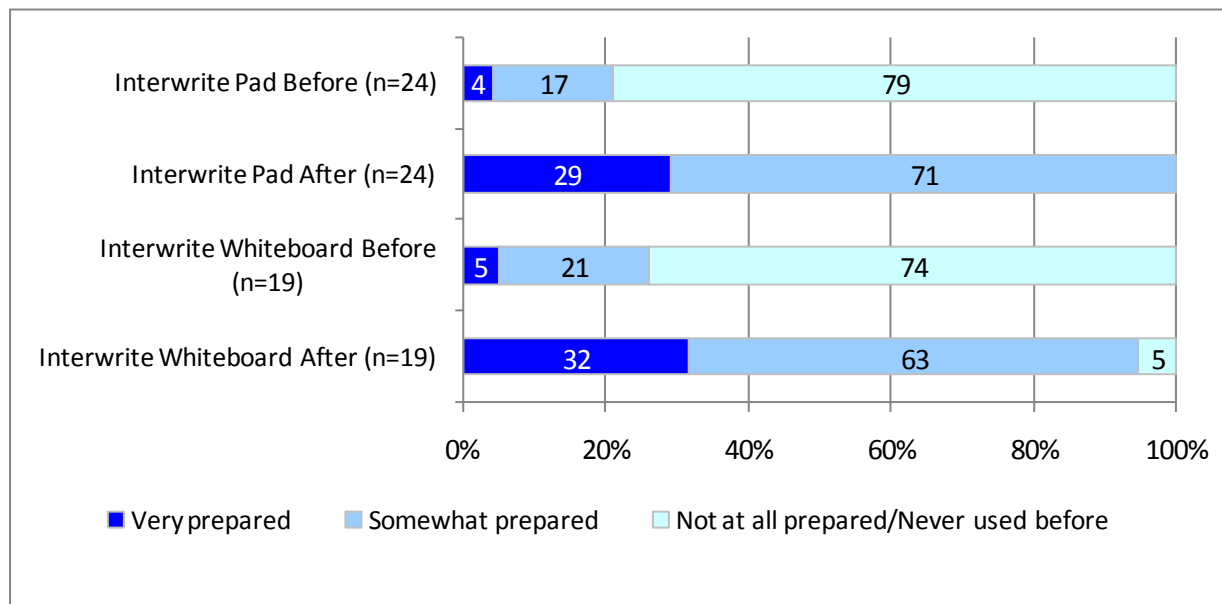
C. Interwrite Workshop

In addition to receiving an iPod, teachers in the Eastern Shore Online Biology project were given the opportunity to participate in another workshop and receive an Interwrite Whiteboard and an Interwrite Pad. The Interwrite Whiteboard provides interactive features that teachers can use in a classroom. Users can project digital images onto the Whiteboard or use it as a traditional whiteboard that teachers and students can write on. The Interwrite Pad is a mobile wireless pad that can also be used interactively in a classroom. On May 28, 2008, the project provided professional development to teachers on how to use these technologies. At the end of this workshop, teachers were asked to complete a survey (Appendix D) to provide feedback on the session as well as on their preparedness to use the technology tools they had received. Twenty-four teachers completed this survey. These teachers were from five Eastern Shore counties: Wicomico County (10), Worcester County (5), Caroline County (3), Queen Anne's County (3), and Talbot County (3).

Perceived Preparedness to Use the Interwrite Technologies

As shown in Figure 7, most of the teachers who responded to the survey said that prior to this workshop they “had never used” or were “not at all prepared” to use the Interwrite Whiteboard or Pad (80% and 74% respectively). Participating in this workshop clearly had a positive impact on the teachers’ preparedness to use the technologies they received. When asked how prepared they felt to use the technologies after the workshop, all of them felt that they were at least “somewhat prepared” to use the Interwrite Pad, and 95 percent felt the same way about the Whiteboard.

Figure 7: Preparedness to Use Interwrite Technologies Before and After the Workshop

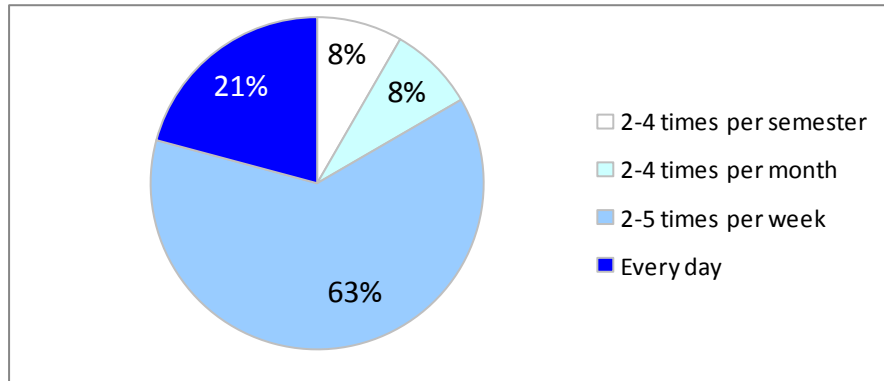


Expected Use of the Interwrite Technologies

The participants were asked how useful they thought the Interwrite Pad would be in their teaching. A majority (70%) of the participants thought that the Interwrite Pad would be “very useful,” while one additional person (5%) indicated that it would be “useful.” The remaining participants (25%) thought it would be “somewhat useful.”

About one-fifth (21%) of the teachers indicated that they anticipated using the Interwrite Pad every day with their students in the upcoming school year (Figure 8). Nearly two-thirds (63%) anticipated using the Pad 2-5 times per week with students. The remaining respondents said they would use the Pad either 2-4 times per month (8%) or 2-4 times per semester (8%).

Figure 8: Anticipated Use of Interwrite Pad (n=24)

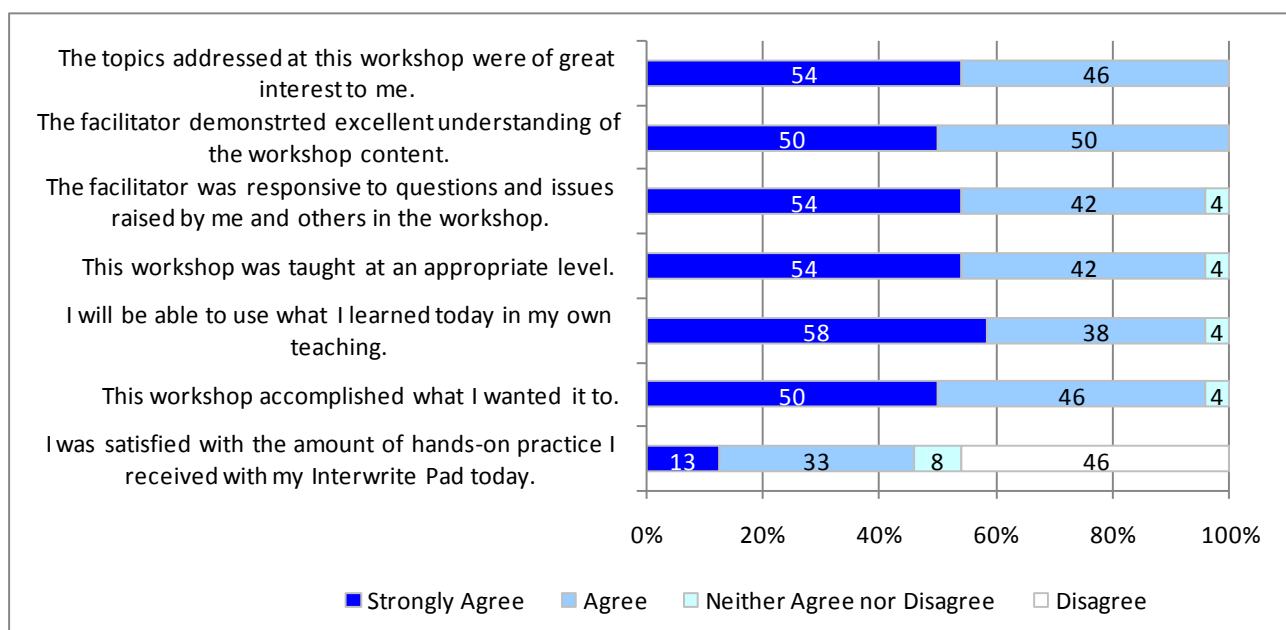


When asked how they anticipated using their Interwrite Pads, eight teachers mentioned specific ways they would use it in their classes for review, discussions, warm-ups, simulations, notes, and for students to respond to questions in class. Four teachers said that they would use the Interwrite Pad to increase student participation and engagement in class. Four also said the Interwrite Pad would provide them with flexibility in the classroom because they would be able to move around instead of only using the monitor at the front of the room.

Feedback on the Workshop

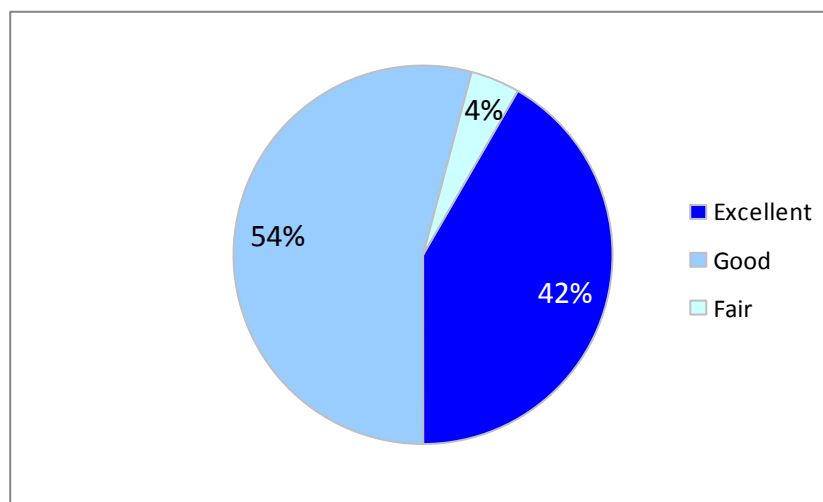
As shown in Figure 9, the participants were very positive about most aspects of the workshop. At least 96 percent “strongly agreed” or “agreed” with most of the statements shown. The only statement about the workshop with which less than 50 percent of participants “strongly agreed” or “agreed” was, “I was satisfied with the amount of hands-on practice I received with my Interwrite Pad today.” Forty-six percent disagreed with this statement. Several participants made clear in their responses to open-ended survey questions that they felt they needed more time for hands-on practice.

Figure 9: Participants’ Feedback on the Interwrite Workshop (n=24)



When asked to rate the length of this workshop, participants were more likely to indicate that it was “too short” (21%) than it was “too long” (8%). Participants were also more likely to feel that the workshop was “too fast” (21%) than that it was “too slow” (4%). Overall, 42 percent rated the workshop as “excellent,” 54 percent rated it as “good” and only one person rated it as “fair” (Figure 10).

Figure 10: Overall Rating of the Interwrite Workshop (n=24)



Other Comments by Participants

Ten participants said after the workshop that they liked being able to see the technology being used for instructional purposes. Five participants indicated that what they liked most was that the presenter was knowledgeable and helpful. Two said that they liked the hands-on approach used in the workshop.

Teachers at the workshop also provided some suggestions for improvement. The suggestion mentioned most frequently (by 11 participants) was that there should be more time provided during the workshop for the participants to practice using the technology. Three teachers also thought that the group of participants should be smaller. Two participants suggested that a follow-up session would help them if they have questions once they try to use the Interwrite board in their classrooms.

Part II: Evaluation of Longer-Term Outcomes

A. Piloting of MSDE Online Biology Course

As described in the logic model on page three, one of the outcomes of this grant is that the MSDE online biology course would be piloted in classrooms for the first time. Macro collected information from this pilot in two ways. First, we conducted a focus group with pilot participants on May 5, 2008 to get their initial reactions to using the course with their students. Second, Macro compiled and analyzed results from a survey that was conducted with pilot participants at the conclusion of the pilot period.

Focus Group with Pilot Participants

Approximately 8 teachers who were piloting the MSDE online course participated in a focus group on May 5, 2008. The moderator guide used can be found in Appendix E. Although the pilot was in its initial stages at that time, the teachers shared insight on their experience piloting the course up to that point. This section describes some of the key issues raised during the focus group discussion.

Use of the Course with Students

Some of the teachers described how they were using the course with their students, as well as successes and challenges they had encountered.

- One teacher tried to have her entire 9th grade class use the course at the same time, but this did not work well because of problems with the MSDE server. As a result, she opted to use it with a projector in the front of the room.
- One teacher had students either double or triple up on a computer. She had a projector, laptop, and surround speakers in her classroom so her students could watch her on the overhead.
- Teachers felt that the online course couldn't stand alone; most had created their own worksheets for students to use in connection with the course.
- One teacher had given students a notebook with all materials from the online course printed out; others thought this was a good idea.
- One of the participants in the group worked primarily with special education students. She had found that her students got a great deal out of the course, as long as someone was working with them.
- Another teacher commented that the students that perform at higher levels liked the examples used in the online module. However, students that perform at a lower level were intimidated by long screens of text and the volume of words in the lesson.
- One of the teachers decided to conduct the entire ecology unit with her class using only the online course. As the course went on, she found that she had to do some additional things (e.g. read everything herself, highlight the most important things, added extra notes) in order for the course to make sense to her students.

Positive Aspects of the Course

The teachers in the focus group highlighted several aspects of the MSDE online biology course that they liked and things they thought worked well. Some of these comments about the course include:

- Teachers liked the videos included in the modules; in particular they mentioned the United Nations video.
- Teachers found the quizzes and video discussions that were available in the online course to be very useful.
- They also said that the online biology course is a useful resource to help kids learn, and that it would be a great self-paced technology course.

Recommendations and Features that Need Improvement

Participants in the focus group also commented on several things about the course that they felt needed to be changed, or that did not work well:

- Several teachers mentioned that they found a number of typos in the course materials that should be corrected.
- The teachers thought that some of the pages were repetitive, and that some concepts were readdressed a number of times.
- The teachers found that the quality of the animations could be improved, as well as the pace of the narration in some of the videos.
- They also suggested adding released HSA questions at end of each section of the course for students to answer.
- Another teacher suggested that the course should include more worksheets and fill in the blanks for students to complete as well as more “checks” to make sure that the students are reading the material.
- The teachers also thought it would be helpful for them to watch a class being taught using the online biology course.

Post-Pilot Survey of Participants

After completing the pilot, teachers provided further input about their experience during the pilot through a written survey (Appendix F). Some of the things they described on this survey included what they hoped to gain from piloting the MSDE online biology course, how frequently they used it and how valuable they found various aspects of the course.

Uses of the Online Course

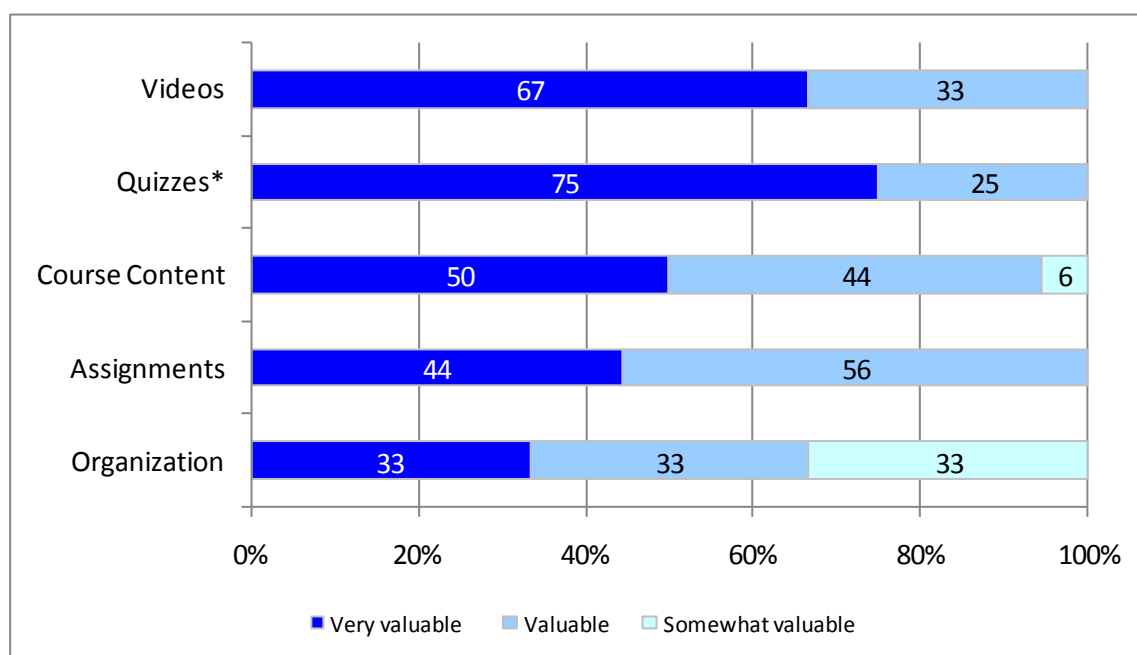
Several participants described using the online pilot to assist them in preparing students for the High School Assessment (HSA). The course was used to reinforce what the students were learning, to help students review, to increase their understanding of the material, and to improve their test scores. Additionally, six respondents described using the pilot for remediation, including some who used the tool in summer school.

Participants decided to pilot the course for various reasons. Four said that they wanted to expand the resources available to them for teaching the subject. For example, some said that they thought the differentiation in the presentation of the information being taught and the “interactive activities” that the online courses provided would help to keep their students’ attention. Three participants took the course to become familiar with the program and website in order to maximize its utility. Two participants also liked the course’s potential to help individual students in specific areas of study.

Value of Specific Aspects of the Pilot of the Online Course

Respondents to the survey were asked to assess the value of several aspects of the online course (Figure 11). For about two-thirds of the respondents (67%) the video and the quizzes were “very valuable” aspects of the course. One-half of respondents found the course content to be “very valuable”. Forty-four percent and 33 percent respectively thought the assignments and organization of the course modules were “very valuable.”

Figure 11: Value of Aspects of the Online Pilot Program (n=18)



*Two respondents indicated not applicable for the quizzes, so the results are based on n=16.

When asked to indicate how they felt about the written material, the most common response was that there was “Too much text, students were overwhelmed” (Table 2). Seventy-two percent of respondents selected that response to the question. Slightly more than a third of participants (39%) thought the written material was “very good,” and a third thought the written portion of the program was “acceptable.” A third of the respondents also thought that the written text was “too long with too much detail.” Twenty-two percent thought the written text materials was “over the heads of student.” The remaining participants responded that the written text “more details needed,” “more text needed” or was “poor.” None of the participants felt as though the text was too “simplistic.”

Table 2: Opinions about the Written Text Material (n=18)⁷

	Percentage responding "Yes"
Too much text, students were overwhelmed	13 (72%)
Very good	7 (39%)
Acceptable	6 (33%)
Too long with too much detail	6 (33%)
Over the heads of students	4 (22%)
More details needed	2 (11%)
More text is needed	1 (6%)
Poor	1 (6%)
Too simplistic	-

Use and Effectiveness of the Online Biology Modules

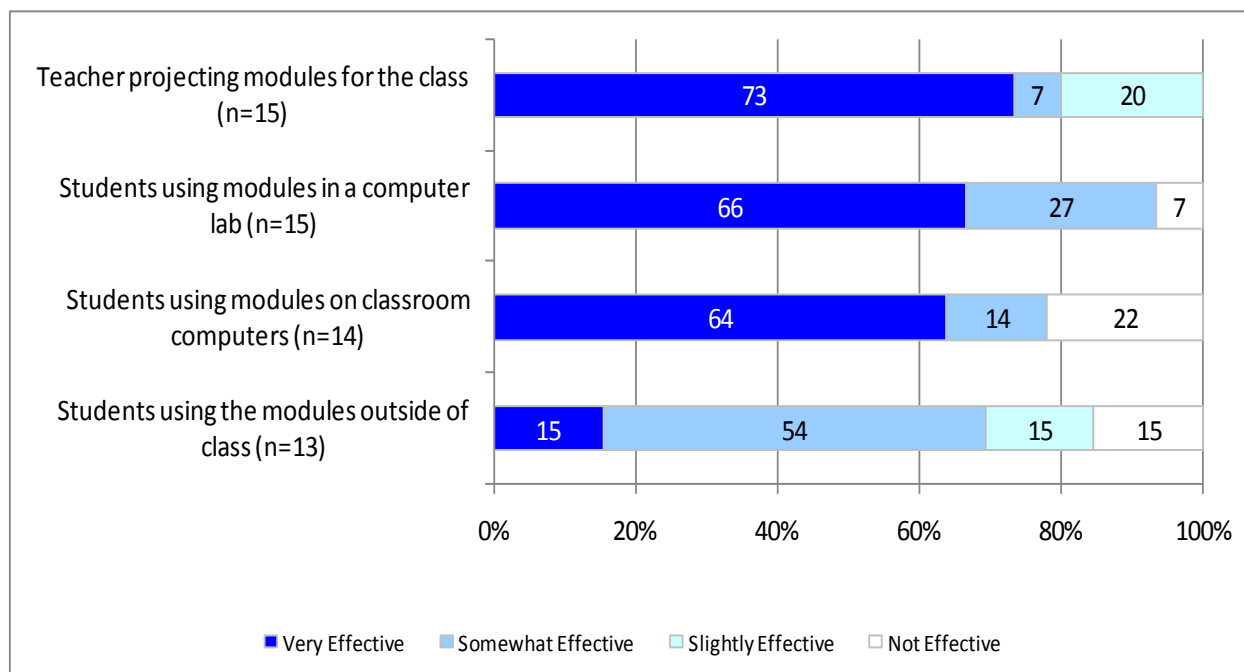
Respondents to the survey indicated that they had used all or parts of four primary course units: the scientific method, ecology, evolution, and cells.

One quarter of participating teachers (25%) used the online modules 11 or more times during the pilot period. More than one-third (38%) used them 6 to 10 times, while 31 percent used them 2 to 5 times. One respondent (5%) only used the online modules once during the pilot period.

The teachers in the pilot were also asked to rate the effectiveness of the online modules in terms of how they were used with students. As shown in Figure 12, nearly two-thirds of participants (61%) found teachers projecting the modules in the class to be “very effective.” More than half (56%) thought it was “very effective” when students used modules in a computer lab and on classroom computers. On the other hand, only a few teachers (11%) felt that having students use the modules outside of the classroom was “very effective.”

⁷ Respondents were given the opportunity to select more than one answer to this question.

Figure 12: Effectiveness of the Online Modules ⁸



All of the respondents said they expected to use the online modules during the following school year. About three quarters of participants (78%) anticipated that they would use the modules for instructional purposes. This included reinforcement, supplementing the teachers' lectures and enhancing students' learning experiences. For example, one participant said the modules would help to "extend and reinforce key concepts." The second most commonly anticipated use of the modules was for remediation and interventions. Slightly less than half of participants (39%) said they would use the modules for remediation and interventions. One other participant who teaches a class of repeat biology students said that the modules "will be a great way to pretest their prior knowledge and then focus on the main aspects they need to cover."

Additional Comments

When asked to describe other positive aspects of the online modules, participants most frequently commented on the fact that the modules were "customizable"—that is, that students could work at their own pace, and teachers could assign different parts of the module to students based on their current knowledge or level. Other advantages about the modules that were mentioned by one or two participants included that:

- The modules are accessible from home;
- The quiz questions resembled the format of HSA questions;
- Virtual labs allowed students to complete otherwise unaffordable lab activities;
- The conversation the modules generated among students was valuable; and
- The videos offered an alternative way to present material.

When asked to identify the biggest problems they encountered in using the online modules, the majority of respondents described problems related to their schools' technology, not from the

⁸ Participants that responded "Didn't use" are not included in this chart.

modules themselves. For example, a third of participants noted that because their servers were slow their students experienced increased wait times when using the modules that wasted class time. Other participants noted that their servers sometimes had crashed when they were using the modules. Some also said that it was hard to access computers for their class to use.

Participants offered several suggestions on how to enhance and improve the utility of the online modules. Two respondents suggested modifying the reading supplements to make them more accessible to readers at lower levels. Others suggested shortening the amount of text and reducing redundancy between the modules. One participant indicated that the website was difficult to navigate both for the teachers and for their students, and suggested holding a workshop to help teachers navigate the website. Another suggestion was to add more interactive activities; one participant thought that if the program were formatted more like a game then students would be more attentive.

Most participants seemed to agree that the online course is, as one put it, “a great start.” Several said it would be a valuable tool and they liked that the modules provide a “ready-made plan for class.” A few teachers think that the interactive features of the program will help to maintain the students’ interest and increase their exposure to technology.

B. Formative Feedback on MSDE Online Biology Course

During the piloting period, participating teachers were asked to provide detailed feedback on the course modules that they were using. This feedback will be compiled and provided to MSDE by the grant leadership itself, so that MSDE can use the comments to make revisions to the course. In this section of our report, Macro provides a higher-level summary of the general topics that participants commented on in their feedback.

Pilot participants submitted a total of 264 comments on the pilot. Of these, 96 were positive statements about the course, while 168 were statements about things that they felt should be revised. Table 3 summarizes the topics of these comments. The three topics mentioned most frequently in positive comments were the video aspects of the course, the assignments and other activities, and the content that was covered. Negative comments most frequently focused on corrections to the content and statements about the organization, formatting or layout of the course.

Table 3: Comments on Aspects of the Online Biology Course

Category	Positive comments	Negative comments
Video (usability, audio, graphics, and animations)	23	24
Assignments and activities	23	23
Content (usefulness, recommendations and corrections)	18	31
Quizzes	14	11
Organization, formatting and layout	10	27
Graphic organizer	4	3
Technical performance and usability of the modules	1	22
Availability of computers and reliable connection	1	3
Edits/typos	-	19
Other	2	5
TOTAL	96	168

Video

Many of the positive comments about the online biology course related to the videos, including usability of the videos, the graphics and the audio. Teachers frequently noted that the videos were interesting and would be engaging for the students. For example, one wrote, “[The] biodiversity video was awesome! The kids were very interested in it and wanted to watch it twice.” Some teachers commented that they liked that the videos were interactive and useful. Others also liked some of the graphics and animations included in the modules because they felt these were good for students who are visual learners and because illustrations helped to make the information clearer.

Other participants had suggestions for how the videos could be improved. One of the issues that several participants raised was that the rate at which the videos give information is too fast and students need to be able to stop, pause or rewind the videos so that they can take notes. Some teachers commented that some of the videos were just graphics and illustrations with no narration. Some teachers felt that a few of the videos were unnecessarily repeated in an activity or unit.

Activities and Assignments

Several of the activities and assignments of the online biology course received positive comments. Some of the specific things that teachers mentioned were the virtual labs, the worksheets for activities such as “Successful Succession” and the articles accompanying activities. For example, one teacher said that one of the worksheets for an activity was “nicely set up for the student to follow as they read the information on the PBS website and view the videos.” Some teachers also felt that the online course activities were easy to incorporate into everyday class activities.

Other respondents provided recommendations for how the activities and assignments could be made more useful. Some asked that the reading activities be made more interactive. Others said that the directions and expectations of students should be made clearer. Some teachers noted that students received no feedback on some of the tasks they performed; they felt that providing this feedback would help keep students on task and engaged. Several teachers also suggested that if students get the wrong answer to a question they should be given the correct answer.

Content

Positive comments about content usually related to specific aspects of a particular unit or activity. For example, several participants noted that they liked explanations or examples provided for some of the units. Some commented that the materials covered all major key points in a given unit.

The most common concern expressed by participants was that some of the units and activities included too much information. For example, one teacher said, “Activity 1 is very wordy—[the] teacher will need to break down the information and explain the vocabulary.” There were also several instances in which teachers felt the information provided was confusing, or even incorrect.

Quizzes

Based on their comments, several of the teachers found the quizzes to be very useful. They liked that they were interactive, and that they provided immediate feedback to students about how well they understood the information. One teacher said, “The quiz is appropriate and easy to follow. It is good that the selected response questions have immediate feedback.” One teacher described how one of the quizzes generated lot of discussion amongst her students.

There were also suggestions as to how the quizzes could be improved. Several, for example, felt that some of the answers provided were incorrect. Others suggested that students should be told at the beginning of a lesson that there will be a quiz. One teacher commented that questions with many possible answers might be difficult for learning-disabled students. She felt that this type of question should be replaced with several questions, each of which has fewer answer options.

Organization, Formatting and Layout

Several participants commented that they liked the diagrams and dialogue boxes that accompanied the text. They also liked that important vocabulary words were in bold. For activities that are on multiple pages, they liked that students can see where they are on the page.

However, some teachers found that it was difficult for them or their students to navigate through the units and activities. Others felt that there were too many different materials on the website, making it confusing and complex; as one wrote, “There are so many things on it at once you could easily get confused.” Some thought that the assignments were difficult to locate, while others said that it was difficult to get from one screen of the course to another.

Technical Performance and Usability of the Modules

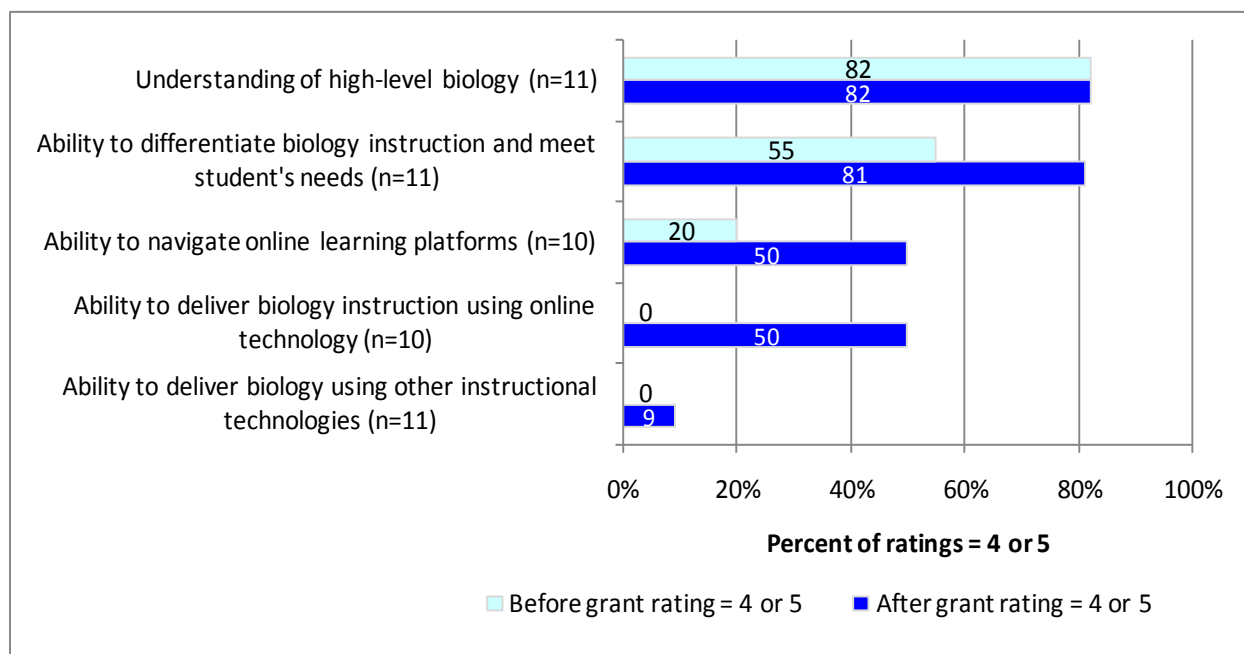
Several of the pilot participants experienced technical difficulties accessing the materials and activities of the course. Some pointed out that several links did not work, and that in some cases it took a long time to download the information. In a few cases a teacher mentioned that there was no link to a quiz where should have been one.

Some of the technical issues experienced may be due to issues of technology at the school level, and not necessarily the functionality of the course itself. For example, one teacher wrote that their school computers crashed when trying to access a particular worksheet unless the document was first saved on the computer. Another said that one of the links was blocked by the school's firewall.

C. Teacher Biology Content Knowledge

At the conclusion of the grant in the fall of 2008, Macro conducted a survey that measured the impact of the grant on teachers' knowledge of biology content. The first section of the survey asked participants to assess their content knowledge and instructional abilities both currently and before the grant began, to determine whether there was a perceived change in knowledge on the part of the teachers. Figure 13 shows participants' perceived knowledge on various topics both before the grant began and at the conclusion of the grant. There was no change in participants' understanding of high level biology. However, in almost every other area teachers reported an increase in knowledge. For example, the percentage of participants rating their ability to differentiate instruction as a "4" or "5" on a five-point scale increased from 55 percent to 81 percent. No one rated their ability to deliver instruction using online learning as a "4" or "5" before the grant, while half did so after the grant. The percentage that rated their ability to deliver biology using other instructional technologies changed from zero to 9 percent.

Figure 13: Retrospective Pre/Post on Biology Knowledge



The second portion of the fall 2008 survey asked participants to answer 20 multiple-choice questions about biology. Since participants had answered these same questions during a fall 2007 online course conducted by the University of Maryland's University College (UMUC), this also provided an opportunity for Macro to measure change over time.

A comparison of teachers' scores on this portion of the survey showed that the average percentage correct decreased slightly on the post-test from 97 percent to 88 percent. However, there are several reasons that this trend is not entirely unexpected. As noted above, the "pre-test" measure was given in the context of an online biology course administered by UMUC. This means that participants answered the questions the first time shortly after having reviewed the content, which likely inflated their scores. Also, while improving teachers' content knowledge was a focus of the UMUC course, other grant activities instead prioritized training teachers to use the MSDE online biology course. Therefore, it is not surprising that participants would have scored highest immediately following the grant activity that focused most directly on content knowledge.

D. Improved Student Biology Achievement

As noted earlier in this report, the overall goal of the ESOBC grant was increased student achievement on the biology High School Assessment (HSA). To evaluate the extent to which this goal was reached, Macro collected and analyzed biology High School Assessment data from four of the six ESOBC school districts.⁹ Our analysis compares the performance of students of "ESOBC teachers"—that is, teachers who participated in the grant—in 2006-07 and 2007-08. Since this was the period of time over which ESOBC teachers received their professional development, one piece of evidence that the grant was successful would be if the performance of these teachers' students improved over time. To control for any external trends in HSA performance that would not be attributable to the ESOBC grant, Macro also analyzed the scores of students taught by "non-ESOBC teachers"—that is, those who did not participate in the grant.

Table 4 shows that the mean score of students taught by ESOBC teachers increased by 0.7 points from 2006-07 to 2007-08. Over the same period of time, the mean score of students taught by non-ESOBC teachers increased by 0.9 points. Therefore, based on this measure there is no evidence that the ESOBC grant had a significant impact on student success on the HSA. If passing rates on the HSA are compared, students taught by ESOBC teachers actually fared slightly worse—their passing rate dropped from 75 percent to 72 percent over this period of time, while the passing rate for students taught by non-ESOBC teachers increased from 70 percent to 73 percent.

⁹ Two districts—Somerset and Talbot—did not provide HSA data for analysis.

Table 4: Mean Scores and Pass Rates

	School Year	N	Mean Score	% Passing ¹⁰
Students of ESOBC Teachers	2006-2007	644	414.1	75%
	2007-2008	643	414.8	72%
Students of Non-ESOBC Teachers	2006-2007	1253	415.9	70%
	2007-2008	1459	416.8	73%

Although the evidence in Table 4 seems to imply that participation in the ESOBC has not had a positive impact on student HSA achievement—and perhaps had a small negative impact—there are several factors to consider when interpreting these results. First, the changes shown here are small, and could easily be attributable to the fact that the scores come from different cohorts of students taking the test. Because most students only take the biology HSA once, it was impossible to track students' performance on the assessment from year to year. Instead, Table 4 compares scores of students taught by ESOBC and non-ESOBC teachers in 2006-07 to the scores of students they taught the following year. Therefore, scoring trends could be attributable to the differences between the two cohorts of students, rather than changes in teacher skills and knowledge.

Second, many ESOBC teachers piloted the course near the end of the year—in some cases, after their students had already taken the HSA in 2008. Therefore, in some cases any impacts of these pilots on HSA scores would not appear in the results shown above.

Third, there is some research that shows that when teachers are implementing new strategies or using new technologies in their classroom, impacts on student test scores may not appear immediately. For example, Macro recently conducted a randomized controlled trial of another online resource that showed that scores actually dropped slightly in the first year, as teachers learned how to best use the new resource, but increased dramatically in the second year. In other words, the fact that no positive impact on student scores were found in this evaluation is not an indication that over the long run, use of the online modules would not lead to improved HSA performance.

¹⁰ Based on cut scores set by MSDE, students who achieved an HSA score of 400 or above were considered to have passed the assessment.

Part III: Summary

This report describes the activities of the ESOBC project during the 2007-2008 school year, and evaluates its progress towards meeting its goals and objectives. Here are the key findings from Macro's evaluation team:

- There was an 18 percent increase (from 53% to 71%) in the teachers' self ratings of their proficiency with technology. These participants felt that using technology in their classrooms would positively impact their students' engagement and motivation. They also thought that using the online biology modules would positively impact their student's biology learning and achievement.
- During the pilot of the MSDE online biology modules, teachers were able to use the course in various ways with their students. In addition to regular level students some teachers also used the course with special education or advanced students. In the future, some teachers will also use the modules to offer remediation and intervention to students.
- As the teachers used the course in the pilot, they were given the opportunity to provide feedback on the modules. Their feedback was very constructive and highlighted things that worked well or that needed improvement. In particular aspect of the course that they found very valuable included the videos, activities and the content of the course. Some things that they felt warranted improvement included the organization and layout of the course.
- The teachers received new technology equipment: an iPod and an Interwrite pad and benefited greatly from participating in professional development on how to use those technologies. The percent of teachers that felt "somewhat prepared" or "very prepared" to use the iPod increased from 43 percent to 86 percent. Participants plan to use the iPods in general ways such as for class lectures. They will also use the technology to help meet the needs of special population students as well as to communicate with and share lessons with other teachers.
- Participation in the Interwrite workshop also greatly improved teachers' preparedness to use the Interwrite technologies. Most of them anticipated using the technologies on a regular basis—at least 2-5 times per week. Most participants were positive about the workshop and thought that overall the workshop was "excellent" or "good." However, several teachers felt that they needed more hands-on practice.
- Most teachers did not perceive changes in their knowledge of biology content. Also, their results on the post biology content quiz decreased when compared to their results on the initial quiz. But it is important to keep in mind the context in which the initial survey was administered and the focus of the grant. Increasing biology knowledge was not the primary emphasis of the grant for the 2007-2008 school year, and the initial quiz was given at a time when participants had just completed the UMUC course.
- Biology HSA results of students whose teachers participated in the course are mixed. Although the mean scores increase slightly from 2006-2007 to 2007-2008 a smaller

percentage of students passed the test in 2008. However, because several of the teachers piloted the MSDE course with their students only late in the year, some of the impacts of these pilots may not have been reflected in these HSA results. In addition, it is important to remember that often there is a learning curve involved with the use of new technology in the classroom, so that benefits on student performance do not appear the first time teachers use the new resources.

Appendix A:
Salisbury University Online Biology
Course Pre/Post Survey

Online Biology Professional Development Course Pre-Pilot Survey

Question 1

School:

Answer:

Question 2

School System:

Answer:

Question 3

Number of years' teaching experience:

Answer:

Question 4

Number of years you have taught biology:

Answer:

Question 5

Current Grade(s) Taught:

Answer:

Question 6

Current Subject(s) Taught:

Answer:

Question 7

Describe the student population in your biology class(es). For example,

Question 8

List the area(s) of certification that you hold.

Answer:

Question 9

What is the highest degree you have completed?

- ☐ Bachelor's
- ☐ Master's
- ☐ Master's Equivalency
- ☐ Master's + 30
- ☐ Master's + 60
- ☐ Doctorate
- ☐ Other

Question 10

If you answered "Other" in the previous question (highest degree completed), please specify which degree you have attained.

Information

A "hybrid" course uses both online and face-to-face (usually classroom and/or lecture) components to deliver *instructional content*.

(This type of course is also sometimes referred to as a "blended" course.) A pure online course does not require any face-to-face meetings.

Question 11

Have you ever *taken* a hybrid or online course before?

- ☐ Yes
- ☐ No (Skip to Question #14)

Question 12

Select the choice(s) which best describes the mix of delivery mode(s) that were used in the hybrid or online course(s) you've taken.

- ☐ Online only, no Face-to-Face (classroom)
- ☐ Face-to-Face (classroom) only, no Online
- ☐ Both Online and Face-to-Face (classroom)
- ☐ Both Online and Face-to-Face (classroom), mostly Online
- ☐ Both Online and Face-to-Face (classroom), mostly Face-to-Face

Question 13

Have you ever *taught* a hybrid or online course before?

- ☐ Yes
- ☐ No (Skip to Question #17)

Question 14

Briefly describe the course title(s), when and where you *taught* the course(s).

Answer:

Question 15

Select the choice(s) which best describes the mix of delivery mode(s) that were used in the hybrid or online course(s) you've taught.

- ☐ Online only, no Face-to-Face (classroom)
- ☐ Both Online and Face-to-Face (classroom)
- ☐ Both Online and Face-to-Face (classroom), mostly Online
- ☐ Both Online and Face-to-Face (classroom), mostly Face-to-Face

Question 16

How do you rate your overall proficiency with technology?

- ☐ Novice
- ☐ Low Intermediate
- ☐ High Intermediate
- ☐ Advanced

Question 17

How frequently are you currently using technology for professional productivity (e.g., research, materials preparation, grades)?

- ☐ Very Frequently (2-5 times per week)
- ☐ Frequently (2-4 times per month)
- ☐ Occasionally (2-4 times per semester)
- ☐ Rarely (1-2 times per year)
- ☐ Never (0 times)

Question 18

How frequently are you currently using technology in the classroom (or other instructional settings) with students?

- ☐ Very Frequently (2-5 times per week)
- ☐ Frequently (2-4 times per month)
- ☐ Occasionally (2-4 times per semester)
- ☐ Rarely (1-2 times per year)
- ☐ Never (0 times)

Question 19

To what extent do you agree with the following statements about technology?

#		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I feel comfortable using technology.					
2	Technology can help teachers address the diverse learning needs of students.					
3	Using technology in instruction can increase students' motivation and enthusiasm about learning.					
4	Using technology in the classroom with students can increase overall student achievement.					

Question 20

In your opinion, what is the biggest challenge you encounter with teaching biology?

Question 21

To what extent do you agree with the following statements about using online resources?

#		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Using online resources engages students in a non-threatening manner.					
2	Using these online resources will have a positive impact on student achievement on the Biology HSA exam.					
3	These online resources will reach students who have not been reached by traditional means of instruction.					

Question 22

To what extent do you agree with the following statements about using the online HSA biology course with students?

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Using the online HSA biology course resources engages students in a non-threatening manner.					
2	Using the online HSA biology resources will have a positive impact on student achievement on the Biology HSA exam.					
3	The online HSA biology will reach students who have not been reached by traditional means of instruction.					
4	Using the online course makes a student more accountable for his/her own learning					

Appendix B:

Podcasting Workshop I Post Survey

**Eastern Shore Online Biology Consortium
Post iPod Workshop Participant Survey**

Please complete this questionnaire and turn it in before you leave today. *The information you provide is confidential and will be analyzed by an independent evaluator; your responses will not be seen by anyone from your district.* Thank you for your assistance.

1. Name: _____ 2. School: _____

3. School District: _____ 4. Grade(s) Taught: _____

5. Do you teach any of the following special populations? (*check all that apply*)

☐ Special education ☐ ESL ☐ Advanced Placement

6. Subject(s) Taught: _____

7. Years of Teaching Experience: _____ 8. Years of Teaching High School Biology: _____

9. Have you used the MSDE online biology course with your students this school year?

☐ Yes, I have used it more than once ☐ Yes, I have used it only once ☐ No, I have never used it

10. The pace of this workshop was:

☐ Just right ☐ Too fast ☐ Too slow

11. The length of this workshop was:

☐ Just right ☐ Too short ☐ Too long

12. To what extent do you agree with the following statements?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a) The goals of the workshop were clearly stated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The goals of the workshop were met.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) I was satisfied with the amount of hands-on practice I received with my iPod today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The topics addressed at this workshop were of great interest to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I will be able to use what I learned today in my own teaching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The facilitator demonstrated excellent understanding of the workshop content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) The facilitator was responsive to questions and issues raised by me and others in the workshop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please Turn Over! ➞

13. What aspects of this workshop did you like most?

14. What suggestions do you have for how this workshop could have been improved?

15. How prepared did you feel to use an iPod for lesson planning and/or classroom instruction BEFORE today's workshop?

- ☐ Very prepared ☐ Somewhat prepared ☐ Not at all prepared ☐ I have never used an iPod before today

16. How prepared do you feel to use an iPod for lesson planning and/or classroom instruction AFTER today's workshop?

- ☐ Very prepared ☐ Somewhat prepared ☐ Not at all prepared

17. Before today, had you ever used an iPod for professional purposes? (e.g., lesson preparation or classroom instruction)?

- ☐ Yes ☐ No

18. How useful do you think your iPod will be for you professionally (e.g., for use in lesson preparation and/or classroom instruction)?

- ☐ Very useful ☐ Useful ☐ Somewhat useful ☐ Not at all useful

19. How, if at all, do you anticipate using your iPod?

20. Overall, today's workshop was:

- ☐ Excellent ☐ Good ☐ Fair ☐ Poor

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

Appendix C:

Podcasting Workshop II Post Survey

**Eastern Shore Online Biology Consortium
Post iPod Workshop Participant Survey II**

Please complete this questionnaire and turn it in before you leave today. *The information you provide is confidential and will be analyzed by an independent evaluator; your responses will not be seen by anyone from your district.*
Thank you for your assistance.

1. Name: _____

2. To what extent do you agree with the following statements?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a) I was satisfied with the amount of hands-on practice I received with my iPod today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The topics addressed at this workshop were of great interest to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) I will be able to use what I learned today in my own teaching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) This workshop was taught at an appropriate level.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What aspects of today's workshop did you like most?

4. What suggestions do you have for how this workshop could have been improved?

5. How prepared did you feel to use an iPod BEFORE Monday's workshop?

- ☐ Very prepared ☐ Somewhat prepared ☐ Not at all prepared ☐ I had never used an iPod before Monday

6. How prepared do you feel to use an iPod AFTER today's workshop?

- ☐ Very prepared ☐ Somewhat prepared ☐ Not at all prepared

7. How likely is it that you will create and use one or more podcasts as part of your teaching next year?

- ☐ Definitely ☐ Probably ☐ Maybe ☐ Probably not ☐ Definitely not

8. What concerns do you have, if any, about using podcasting in your class?

9. Overall, today's workshop was:

- ☐ Excellent ☐ Good ☐ Fair ☐ Poor

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

Appendix D:

Interwrite Workshop Post Survey

**Eastern Shore Online Biology Consortium
Post Interwrite Workshop Participant Survey**

Please complete this questionnaire and turn it in before you leave today. *The information you provide is confidential and will be analyzed by an independent evaluator; your responses will not be seen by anyone from your district.* Thank you for your assistance.

1. Name: _____ 2. District: _____

3. To what extent do you agree with the following statements?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a) This workshop accomplished what I wanted it to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The topics addressed at this workshop were of great interest to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) This workshop was taught at an appropriate level.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) I will be able to use what I learned today in my own teaching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) I was satisfied with the amount of hands-on practice I received with my Interwrite Pad today.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The facilitator demonstrated excellent understanding of the workshop content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) The facilitator was responsive to questions and issues raised by me and others in the workshop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. The pace of this workshop was:

☐ Just right ☐ Too fast ☐ Too slow

5. The length of this workshop was:

☐ Just right ☐ Too short ☐ Too long

6. What aspects of this workshop did you like most?

7. What suggestions do you have for how this workshop could have been improved?

Please Turn Over! ➞

8. How prepared did you feel to use the following kinds of educational technology BEFORE today's workshop?

	Very prepared	Somewhat prepared	Not at all prepared	Never used before this workshop
a) Interwrite Whiteboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Interwrite Pad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. How prepared do you feel to use the following kinds of educational technology AFTER today's workshop?

	Very prepared	Somewhat prepared	Not at all prepared
a) Interwrite Whiteboard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Interwrite Pad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. How useful do you think your Interwrite Pad will be for you in your teaching?

☐ Very useful ☐ Useful ☐ Somewhat useful ☐ Not at all useful

11. How, if at all, do you anticipate using your Interwrite Pad with your students?

12. How frequently do you anticipate using the Interwrite pad in the classroom?

☐ Everyday ☐ 2-5 times per week ☐ 2-4 times per month ☐ 2-4 times per semester ☐ 1-2 times per year ☐ Never

13. Overall, today's workshop was:

☐ Excellent ☐ Good ☐ Fair ☐ Poor

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

Appendix E:

Pilot Teachers Focus Group Moderator Guide

Moderator's Guide for ESOBC Participant Focus Group

May 5, 2008

Welcome and Purpose of Discussion

I would like to thank you for taking time out of your busy schedules to participate in today's discussion. I am (name) with Macro International and we are the evaluators of the ESOBC grant. This means that we are working with the LEAs participating in the grant to help them gather information about how effective various grant activities have been.

You have been invited to participate in this discussion because you are piloting various sections of the online biology course being developed by the MSDE. The purpose of this focus group is to gain insights and feedback into your experience piloting sections of the course with your students. Your input may be used to inform future professional development in similar projects, as well as possible revisions to the course itself.

Just so you know, I am an independent evaluator for the grant, so I have no vested interest in any one point of view. Please speak honestly and candidly.

Ask participants to introduce themselves, say where they; how long they have been teaching biology, and which grade levels and types of students. At that point, guide a discussion centered on the following questions:

Training/Preparation to Use Online Modules (10 minutes)

1. Please describe the training that you received on how to use the online modules before you began piloting them. How effective was this training?
 - Were there any ways in which the training was not as effective as it could have been? If so, what are they?
2. Before you began using the online modules in your classroom, how well-prepared did you feel to do so?
 - With which aspects of the online modules did you feel least prepared?

Use of the Online Modules (10 minutes)

3. Describe how you have been using the online modules with your students.
 - Do students work individually? Do they work in groups?
 - Do you bring students to the lab, or do they work in your classroom?
 - Do you ask students to use the modules outside of class time, or only during class time?
4. Have you found that some ways of using the online modules are more effective than others? Which are most effective? Which are least effective?

5. Has using the online modules changed at all what you do in the rest of your teaching—that is, your traditional, “non-online” teaching?

Impact of the Online Modules (25 minutes)

6. How have students reacted to using the online modules?
 - How, if at all, has the course affected their motivation?
 - How, if at all, has it affected their learning?
7. In what ways have you found the online modules to be most effective in improving students’ learning?
 - Could you provide an example of a situation in which you found the modules particularly effective?
8. In what ways have the modules been least effective?
9. Do you think the online modules work better for some kinds of students than for others? If so, what students benefit most? What students benefit least?
 - Have you found that the modules are more or less effective for high-achieving students vs. low-achieving students?
10. Have you had any technical difficulties interfere with your use of these modules? How have you tried to overcome these difficulties? Have you been successful in overcoming them?
 - Do the students have the technological knowledge to use the course effectively, or do they require some guidance?

Feedback/Recommendations (15 minutes)

11. Is there anything that has surprised you about using the online modules?
12. Is there anything that you would change about the online modules that you think would make them easier to use, or would make them more effective?
 - Are there any additional resources that should be provided to teachers that would make the modules more useful?
13. What advice would you offer teachers who were about to start using these online modules in their classes?
14. Are there any aspects of the online biology course with which you still do not feel comfortable? If so, what were they? What would help you to become more comfortable?
15. Obviously, one reason that you have been using the online modules is that you are involved in this pilot study. Will you use this online course with students next year, after the pilot has ended? Why? Why not?
 - *Would you change the way you use it? If so, how?*

Appendix F:

Online Biology Course Pilot Post Use Survey

HSA Biology Online Pilot Post Use Survey

Name _____ School District _____

School _____

1. Which unit(s) did your students use?
2. What did you hope to gain by using the online pilot?

3. How valuable did you find the following aspects of the online pilot program?

	Very Valuable	Valuable	Somewhat Valuable	Not Valuable	Not Applicable
Course Content					
Organization					
Activities					
Virtual Labs					
Quizzes					
Summaries					
Assignments					
Key Concept Boxes					
Interactives					
Videos					
Closure Questions					
Overall Value of the Pilot					

4. How do you feel about the written text material? (You may check more than one)

- _____ Very good
- _____ Acceptable
- _____ Poor
- _____ Too long w/too much detail
- _____ More details needed
- _____ Over the heads of students
- _____ Too simplistic
- _____ Too much text, students were overwhelmed
- _____ More text is needed

5. In the classes where you conducted the pilot, about how many times did you use the online modules?

_____ 1 or 2 times

_____ 3 to 5 times

_____ 6 to 10 times

_____ 11 or more times

6. Do you anticipate using the online modules next school year?

_____ Yes, a few times

_____ Yes, consistently throughout the year

_____ No, I do not expect to use it

7. If you expect to use the modules, in what ways do you anticipate using them?

8. List any suggestions you have in re to use of the modules.

9. Would you be willing to assist other teachers in using the online modules? _____ Yes _____ No

10. Rate the effectiveness of the online modules in the following ways.

	Very Effective	Somewhat Effective	Slightly Effective	Not Effective	Didn't use it this way
Students using modules outside of class					
Students using modules in a computer lab					
Students using modules on classroom computers					
Teacher projecting modules for the class					
Other (please specify)					

11. What were the biggest problems you had in using the online modules?

12. What were some advantages to using the online modules?

13. Please list any further comments about your use of the online pilot program.

Appendix G:

Post Biology Knowledge Questionnaire

Eastern Shore Online Biology Grant Post Knowledge Survey

Dear Biology Teacher:

This questionnaire is being conducted by Macro International, a research firm that has been hired to evaluate the Eastern Shore Online Biology Grant.

There are two parts to this instrument to help determine changes in your knowledge and ability as a result of participating in the Eastern Shore Online Biology Grant. The first section includes retrospective pre and post questions, while the questions in the second section are designed to measure changes in teacher content knowledge over time.

Please answer all of the questions. The questionnaire should take no more than 15 minutes to complete. All of your responses will be strictly confidential. Macro International will report results only in aggregate form, with no names attached.

Thank you for your assistance.

Name:

School district:

Part I

Please indicate your responses using a five-point scale in which 1 is low and 5 is high:

How would you assess each of the following CURRENTLY?

	1=Low	2	3= Average	4	5=High
1) Your understanding of high-level biology content					
2) Your ability to differentiate biology instruction and meet the needs of individual students					
3) Your ability to navigate online learning platforms					
4) Your ability to deliver biology instruction using online technology					
5) Your ability to deliver biology instruction using other instructional technologies (such as an iPod or Interwrite pad)					

How would you assess each of the following IN THE FALL OF 2007, BEFORE YOU PARTICIPATED IN ANY ACTIVITIES THROUGH THIS GRANT?

	1=Low	2	3= Average	4	5=High
1) Your understanding of high-level biology content					
2) Your ability to differentiate biology instruction and meet the needs of individual students					
3) Your ability to navigate online learning platforms					
4) Your ability to deliver biology instruction using online technology					
5) Your ability to deliver biology instruction using other instructional technologies (such as an iPod or Interwrite pad)					

Part II

Directions: Please answer each multiple choice question by clicking on the answer that you think is correct.

Multiple Choice

- Which term means that two or more organisms live together in close association?
 - symbiosis
 - coevolution
 - population
 - endocytosis
- Lipids are made up of:
 - long chains of amino acids
 - many monosaccharides
 - glycerol and three fatty acids
 - long chains of nucleotides
- Almost all plant cell walls are made of:
 - chitin
 - sucrose
 - silica
 - cellulose

4. Which of these cell parts is *not* paired correctly with its function?
- a) nucleus---control center
 - b) ribosome---site of protein synthesis
 - c) mitochondrion---site of photosynthesis
 - d) plasma membrane---regulation of what passes in and out of cell
5. When two different solutions have the same concentration of solutes, they are:
- a) hypotonic
 - b) hypertonic
 - c) isotonic
 - d) heterogeneous
6. The movement of molecules from an area of high concentration to an area of low concentration is:
- a) diffusion
 - b) osmosis
 - c) pinocytosis
 - d) phagocytosis
7. Abigail was examining a plant cell under the microscope and she noticed a huge space in the cell. Most likely what was she seeing?
- a) Vesicle
 - b) Lysosome
 - c) Vacuole
 - d) Endoplasmic reticulum
 - e) Nucleolus
8. In an exergonic reaction,
- a) the products contain more energy than the reactants
 - b) energy is released
 - c) the products contain less energy than the reactants
 - d) Both b and c
9. Fat is used in the body:
- a) for long-term energy storage
 - b) for cells' immediate energy needs
 - c) as a substitute for carbohydrates and proteins
 - d) as a coenzyme in metabolism

10. Which of the following represent potential energy?
- a) A battery
 - b) Pencil held 4 feet off the floor
 - c) A skier at the top of the hill
 - d) A train that has not left the station yet
 - e) All of the above
11. Energy called ____ is made in the reactions of cellular respiration:
- a) FAD
 - b) NAD
 - c) ATP
 - d) NADP
12. What are the raw materials needed for photosynthesis?
- a) carbon dioxide and glucose
 - b) carbon dioxide and water
 - c) glucose and oxygen
 - d) glucose and carbon dioxide
13. The light-independent reactions are also known as:
- a) Carbon Fixation
 - b) Calvin Cycle
 - c) Krebs's Cycle
 - d) Both a and b
14. Which of the following is a correct description of photosynthesis?
- a) Solar energy is used to synthesize glucose molecules using water and carbon dioxide, with generation of oxygen as a byproduct.
 - b) Solar energy is used to synthesize ATP molecules using water and carbon dioxide, with generation of oxygen as a byproduct.
 - c) Solar energy is used to synthesize photons using water and carbon dioxide, with generation of carbon dioxide as a byproduct.
 - d) Solar energy is used to synthesize glucose molecules using oxygen, with generation of more oxygen as a byproduct.
 - e) Solar energy is used to synthesize glucose molecules using water and carbon dioxide, with generation of phosphates and nitrates as a byproduct.
15. What gas is an end product derived from the breakdown of sugar?
- a) carbon dioxide
 - b) oxygen
 - c) nitrogen
 - d) hydrogen

16. What important event occurs during the electron transport chain?
- a) Acetyl CoA combines with a four carbon molecule to form citric acid.
 - b) NADH forms NAD.
 - c) ATP is formed.
 - d) Glucose is cut into two three-carbon molecules.
17. Where in a cell does the Krebs's cycle occur?
- a) in the cytoplasm
 - b) in the chloroplast
 - c) in the nucleus
 - d) in the mitochondrion
18. What is the energy yield per glucose in aerobic cell respiration?
- a) 2
 - b) 4
 - c) 32
 - d) 36
19. The sequence of amino acids is the ____ structure of proteins.
- a) primary
 - b) secondary
 - c) tertiary
 - d) quaternary
 - e) stereo
20. Stacks of thylakoid membranes in the chloroplasts are:
- a) cell membrane in foldings
 - b) grana
 - c) cristae
 - d) stroma